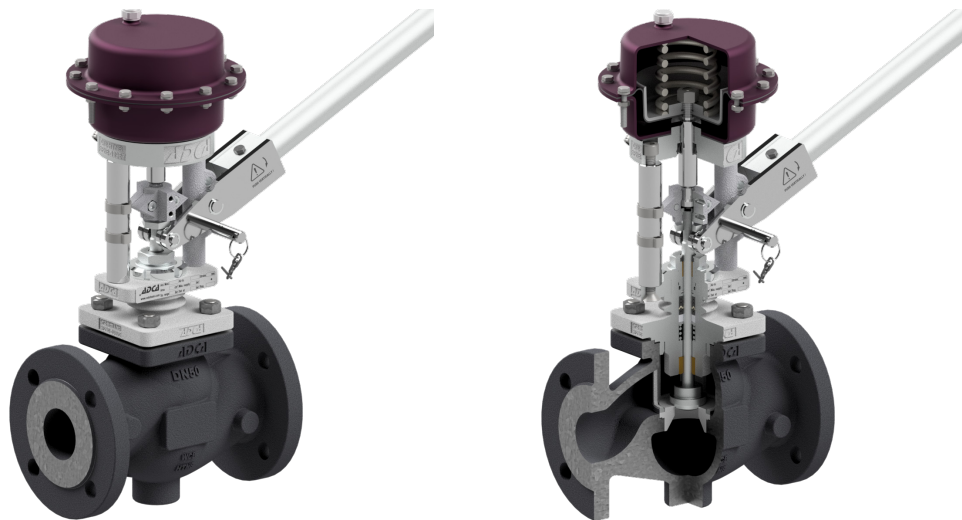


VPA26/2 INTERMITTENT BLOWDOWN VALVES

INSTALLATION AND MAINTENANCE INSTRUCTIONS



ADCATrol

GENERAL INFORMATION

- These instructions must be carefully read before performing any work involving VALSTEAM ADCA products. Failure to observe these instructions may result in hazardous situations.
- These instructions describe the entire life cycle of the product. Keep them in a location that is accessible to every user and make these instructions available to every new owner of the product.
- Current regional and plant safety regulations must be considered and followed during installation, operation, and maintenance work.
- The images shown in these instructions are for illustration purposes only.
- For the problems that cannot be solved with the help of these instructions, please contact VALSTEAM ADCA or its representative.

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We reserve the right to change the design and material of this product without notice.

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1. SAFETY INFORMATION

1.1. Explanation of symbols



DANGER

Hazardous situation which, if not avoided by applying the correct preventive measures, will result in fatal or serious injury and/or considerable damage to property.



WARNING

Hazardous situation which, if not avoided by applying the correct preventive measures, could result in fatal or serious injury and/or considerable damage to property.



CAUTION

Hazardous situation which, if not avoided by applying the correct preventive measures, could result in moderately severe or minor injury.



NOTICE

Situation which, if not avoided, can result in property damage or product malfunction.



NOTE

Indicates additional information, tips and recommendations.

1.2. Intended use

Refer to the markings on the device, such as nameplate and laser markings, Information Sheet (IS) and these Installation and Maintenance Instructions (IMI) to check that the product was designed for the intended use and meets the specifications used for sizing and selection. This includes checking application, material suitability, process medium, pressure and temperature as well as their respective limiting values.

VALSTEAM ADCA does not assume any responsibility for damage resulting from inappropriate use of the product, damage caused by external stresses or any other external factors. Correct installation of the product is the full responsibility of the contractor.

Inappropriate use of the product is any use other than the one described in this chapter. Inappropriate use also includes:

- Use of spare parts which are not genuine;
- Performance of maintenance work not described in these instructions;
- Use outside the limits defined by the accessories connected to the product.
- Unauthorized modifications to the product.

If the product is to be used for an application or with a fluid other than the one it was designed for, contact VALSTEAM ADCA.

1.3. Qualification of personnel

Handling, installation, operation and maintenance work must be carried out by fully trained and qualified personnel, capable of judging the work which they are assigned to perform and recognizing potentially hazardous situations. They should be trained to properly use this product according to these Installation and Maintenance Instructions.

Where a formal “Permits to Work” system is implemented in the plant it must be complied with.

1.4. Personal protective equipment

Personal protective equipment should always be worn during work in order to protect against hazards posed by e.g. the process medium, dangerous temperatures, noise, falling or projected objects, working at height. These equipment includes a helmet, safety glasses, safety harness, protective clothes, safety shoes, hearing protection, etc.

NOTE

Always assess whether you or others in your vicinity require any protective equipment. When in doubt check with the plant’s health & safety responsible personnel for details on required protective equipment.

1.5. The system

The complete system should be assessed as well as every action (e.g. closing of shut-off valves, disconnection of the power supply) to ensure this will not bring additional risk to personnel or property.

Dangerous actions that can result in a hazardous situation include isolation of protective devices such as safety valve, vents, vacuum relief valves, disconnection of electric safety devices, sensors and alarms.

1.6. ATEX

If the product is in the scope of the ATEX 2014/34/EU directive and as such bears the Ex marking, consult its specific Additional Instructions for use in Potentially Explosive Areas (IMI EX). In such cases, handling, installation, operation and maintenance work must only be performed by personnel qualified and authorized to work in potentially explosive areas.

1.7. General safety notes



DANGER

RISK OF BURSTING IN PRESSURE EQUIPMENT

Valves, ancillaries and pipelines are pressure equipment. Working above their operating limits or improper opening can lead to component bursting.

- Observe the maximum operating limits of the product and check if they are lower than those of the system in which it is being installed. Check the product Information Sheet (IS).
- Install a safety device.
- Before starting any work on the product, depressurize it and cool or heat it up to ambient temperature. This also applies to the line in which it is fitted.
- Drain the process medium from the product and all the relevant plant sections.

RISK OF BURSTING IN THE ACTUATOR

Pneumatic actuators can be under pressure. Working above their operating limits or improper opening can lead to component bursting.

- Observe the maximum operating limits of the actuator and ensure the supply pressure respects these limits.
- Before performing maintenance work on the actuator, disconnect the signal pressure supply.



WARNING

RISK OF BURNS

Depending on the operating conditions, products and pipelines may get very hot or cold and cause burn injuries.

- Do not touch the product while it is hot or cold, allowing it firstly to cool down or heat up.
- Wear protective clothing and safety gloves during working operation.
- Thermally insulate tubes and product's as a preventive measure.

RISK OF HEARING LOSS

Depending on the operating conditions, the product may generate loud noises.

- Wear hearing protection when in the vicinity of the product.



WARNING

RISK OF INJURY CAUSED BY FLUID ATTACK ON PRODUCTS MATERIALS

The product must only be used with mediums that do not attack the materials of the product (body, gaskets, seals). Otherwise, leaks may occur, and hot and/or hazardous fluid can escape.

- Do not use the product with mediums other than the ones it was designed for. Check section 1.2 - Intended Use.
- Prevent medium contamination.

RISK OF INJURY CAUSED BY UNDER TIGHTENED PRODUCT OR ITS COMPONENTS

Excessively low tightening torques may cause medium to escape or and/or components to be projected at high speed which may result in a hazardous situation depending on the medium, chemical properties and/or its operating conditions.

- Do not loosen any screw while the equipment is pressurized.
- Observe the specified tightening torques on these Installation and Maintenance Instructions. If the relevant torque value is not mentioned contact VALSTEAM ADCA.

RISK OF INJURY AS A RESULT OF ILLEGIBLE INFORMATION

Important information written in the product nameplate, markings and warning signs may wear overtime or get illegible due to e.g. dirt accumulation, resulting in hazardous situations and personal injury or property damage.

- Keep nameplates, markings and warning signs in a legible state, replacing when illegible, missing or damaged.



CAUTION

RISK OF INJURY DUE TO RESIDUAL PROCESS MEDIUM

Direct contact with dangerous process medium may lead to personal injury, e.g. smoke inhalation and chemical burns.

- Drain the process medium from the product and all the relevant plant sections.
- Wear protective clothing, safety gloves, mask, and eye protection.

RISK OF INJURY DUE TO IMPROPER HANDLING

Manual handling (e.g. lifting, carrying, pushing, pulling) of large and/or heavy products may result in personal injury.

- Assess the risk associated with the handling task.
- Use adequate handling methods and appropriate auxiliary handling equipment.



CAUTION

RISK OF CRUSHING INJURY DUE TO MOVING PARTS

The movement of the actuator stem during installation can crush hands and fingers.

- Keep hands and fingers away from the actuator stem and yoke while pressure supply is connected to the actuator. Make sure to depressurize the actuator from any remaining pressure.
- Before performing maintenance work on the actuator, disconnect the signal pressure supply.
- When performing work that requires signal pressure to be supplied to the actuator during specific steps, pay special care not to place hands and fingers between moving parts.
- If for some reason the actuator stem is stuck in mid stroke position carefully release compression force before touching the actuator stem or other potentially moving parts.

RISK OF INJURY DUE TO PRELOADED SPRINGS

Assembled actuators have preloaded springs inside.

- Relieve spring compression evenly when disassembling the actuator. Two to four longer bolts are installed on actuators with higher spring compressions, loosen these bolts lastly and evenly.
- Do not work on the actuator while it is still installed on the control valve as a further spring compression is applied when assembling the actuator onto the control valve.
- Always follow the relevant maintenance instructions described in this document when opening the actuator.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO EXCESSIVELY HIGH TIGHTENING TORQUES

High tightening torques may lead to premature wearing of product components.

- Observe the specified tightening torques on these Installation and Maintenance Instructions. If the relevant torque value is not mentioned contact VALSTEAM ADCA.

2. PRODUCT INFORMATION

The ADCATrol VPA26/2 series of blowdown valve are specially designed for application on steam boilers, to remove sludge sediments which naturally settle on the bottom of the boiler. These intermittent valves operate manually by means of a manual operation lever and/or automatically with a diaphragm actuator and timed controller.

2.1. Principle of operation

Upstream boiler water pressure aids the spring force of the actuator or manual operation top to keep the valve shut (FTC – Flow to close).

The valve stem (7) moves according to the stroke direction of the actuating mechanism, which in turn changes the plug (3) position in relation to the seat (2) and thus controls the flow which passes through the valve.

Operation is performed by pushing the manual lever or by supplying compressed air or pressurized water to the diaphragm actuator. This moves the plug away from the seat (2) and opens the valve. The rapid opening movement causes sludge sediments to be sucked out and discharged. Subsequent slow release of the manual lever or disconnection of air supply pressure to the diaphragm actuator causes the plug to reseat and the valve closes.

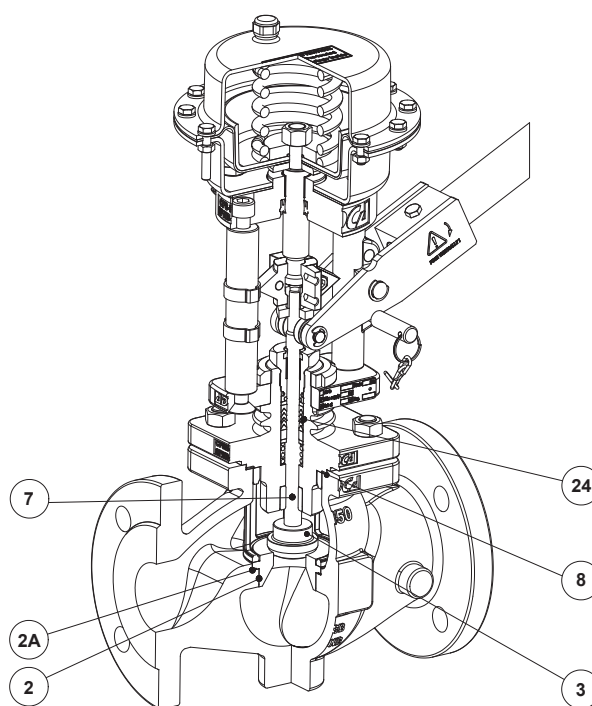


Fig. 1

Body sealing is achieved through the gasket (8) and stem sealing is achieved through the chevron packing set (24). The seat seals against the body through the seat gasket (2A).

The valve actuator can be equipped with mechanical limit switches and inductive limit switch boxes for monitorization. An optional 3/2 solenoid valve with timer control can be fitted directly to the actuator.

2.2. Certification

This product has been specifically designed for use with liquids, namely superheated water, and others which are in Group 2 of the European PED – 2014/68/EU Pressure Equipment Directive and it complies with its requirements.

CE MARKING – GROUP 2 (PED – European Directive)	
PN 40	Category
3/4" to 1" – DN 20 to 32	SEP
1 1/2" to 2" – DN 40 to 50	1 (CE Marked)



NOTE

If the product falls within category SEP it must not be CE marked, unless other directives are applicable.

This product is not in the scope of the ATEX 2014/34/EU directive as it does not have its own potential ignition source. Personnel responsible for the plant installation must assess the risks caused by static electricity and take the necessary precautionary measures to prevent static charge. These measures include e.g. connection of the product to the equipotential bonding system.

When the product is supplied with manual operation top it is classified as a hand-operated valves and is thus not in the scope of the ATEX 2014/34/EU directive. Nonetheless, personnel responsible for the plant installation must assess the risks caused by static electricity and take the necessary precautionary measures to prevent static charge. These measures include e.g. connection of the product to the equipotential bonding system.

When the product is supplied with a pneumatic actuator, and is intended to be used in a potentially explosive environment contact VALSTEAM ADCA.

2.3. Product identification

The following items are indicated on the product nameplate or directly on its body:


- Manufacturer
- Product model (e.g. VPA26/2S)
- Pressure rating (e.g. PN 40)
- Nominal size (e.g. DN 40)
- Stem sealing (e.g. Pack.: V1.2)
- Flow rate coefficient (e.g. Kvs: 16 m³/h)
- Min. operating temperature (e.g. Tmin: -10 °C)
- Max. operating temperature (e.g. Tmax: 250 °C)
- Flow direction (indicated by an arrow)
- Diaphragm area (when applicable e.g. 100 cm²)
- Direction of action (e.g. Air to close)
- Operating stroke (e.g. 12 mm)

- Operating range (e.g. 2 – 3,2 bar)
- Spring range (e.g. 2 – 4 bar)
- Maximum supply pressure (e.g. 6 bar)
- Serial number and year of manufacturing (e.g. Reg.:17483/19)
- Ordering code (e.g. Code: VP262SAH1SX1FGN40)
- CE Marking (when applicable – see section 2.2 – Certification)
- EX Marking (when applicable e.g. EX h IIB T6...T3 Gb – see section 2.2 – Certification)

2.4. Technical data


For technical data including dimensions, materials, limiting conditions and versions refer to the product respective Information Sheet (IS).

3. TRANSPORT, STORAGE AND PACKAGING

 **WARNING**


RISK DUE TO FALLING LOADS
 Loads may tip or fall over resulting in damage to property, serious injury or death.

- Use suitable equipment when moving or lifting suspended loads.
- Make sure no one is standing below the suspended load.

 **CAUTION**

RISK OF INJURY DUE TO IMPROPER HANDLING
 Manual handling (e.g. lifting, carrying, pushing, pulling) of large and/or heavy products may result in personal injury such as back injury.

- Assess the risk associated with the handling task.
- Use adequate handling methods and appropriate auxiliary handling equipment.

 **NOTICE**

RISK OF PRODUCT DAMAGE DUE TO IMPROPER STORAGE

- Do not remove any packaging or protective covers until immediately before installation at the site.
- Store the product in a solid base in a dry, cool and dust-free environment.
- Until its installation, protect it from the weather, dirt, corrosive atmospheres and other harmful influences.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO LONG TERM STORAGE

Some product components may deteriorate with time (e.g. valve packings, seals).

- Do not store the product for more than 12 months.
- If for any reason the product must be stored for longer periods of time contact VALSTEAM ADCA.

Products are individually wrapped in plastic film, thermo shrinkable plastic and/or stored in a cardboard box as they leave VALSTEAM ADCA. Avoid removing packaging and any protective cover until immediately before installing the product at the site.



NOTE

If the transport packaging has any shipping damage contact VALSTEAM ADCA or its representative.

Before storing and transporting the product protect it from impacts and mechanical damage, paying special care with sealing surfaces and other fragile parts.



NOTE

If the corrosion protection (paint and other surface coatings) of the product is damaged during transport or other handling procedures repair it immediately.

4. INSTALLATION

Before performing any installation work, refer to section 1 – Safety information.



WARNING

RISK OF INJURY DUE TO INSUFFICIENT SUPPORT DURING INSTALLATION

Insufficient support of the product during installation may cause it to fall and cause personal injury.

- Ensure the product is safely held in place during installation.
- Wear protective safety shoes.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO STRESS

The product is not intended to withstand external stresses that may be induced by the system to which it is being connected to.

- Make sure that the connected pipe does not subject the body to any stress (forces or torques) during installation and operation.
- Do not use the product as an elevation point.

4.1. Preparation for installation

Before installation, make sure the following conditions are met:

- The installation area has easy access and the device is to be installed in a position where operation and maintenance work can be performed safely.
- The product will be installed with proper support and free of any stresses that can be induced by the system due to e.g. pipe expansions. The necessary precautions are recommended during system design.
- The pipeline where the product will be installed is designed in such a way that it takes into account the weight of the product. The pipeline may require support on both sides next to the product, particularly if its size and weight are considerable and especially if vibrations are to be expected in the system.
- The product is not damaged.
- Make sure all the necessary materials and tools are readily available during installation work.
- Referring to this Installation and Maintenance Instructions (IMI), Information Sheet (IS) and nameplate, check that the product is suitable for the intended installation: temperature, medium, pressure, temperature, etc. – see section 1.2 – Intended use.
- Check that there are no foreign bodies inside the pipelines and ancillaries, flushing may be necessary. These should be thoroughly cleaned.
- Check any mounted pressure gauges and make sure they function properly.
- Consider good hydraulic flow control to avoid pressure surges and avoid dead legs on pipeline branches.
- The pipeline between the boiler and the blowdown valve does not exceed 2 meters.
- The pipeline downstream of the blowdown valve is laid down with a downwards slope in such a way that it does not accumulate medium inside after a blowdown cycle. If not possible, provide other means to ensure proper drainage.
- In case of valves with lever assembly, make sure there is enough space in its surroundings to allow safe and practical operation.
- In case of valves with pneumatic actuator, an air filter regulator should be installed

to ensure that the supply pressure does not exceed the maximum supply pressure indicated on the actuator. The air supply must be dry and free of oil.

- The air supply must only be fed to the pressure chamber which is opposite to the spring chamber. The vent plug must be left unrestricted.
- If the actuator is to be installed outdoors make sure e.g. rain water may not be allowed inside the actuator (sucked in) when stroking by providing the necessary means of protection. Mushroom type vent plugs are available, contact VALSTEAM ADCA.



NOTE

Assembly Drawings (AD) with assembly details and parts lists are available on request.

4.2. Installation procedure

1. Remove plastic film and other packaging, as well the protective covers which are placed on flanges or connection ends. Make sure the blowdown valve is free from foreign matter.
2. The recommended installation position is horizontal with the actuator and/or lever pointing upwards.
3. The blowdown valve has an arrow or inlet/outlet designations, be sure that it is installed in the appropriate direction according to fluid flow.
4. Take care with jointing materials and sealing compounds to ensure that none may be permitted to block or enter the steam trap causing malfunction. Use appropriate flange gaskets.
5. If the valve is fitted with a diaphragm actuator, connect the supply line to the actuator fitting (40). Use a tube/hose with at least 5mm internal diameter (ID) and do not replace the original vent plug (66). Apply the required supply pressure to ensure full stroke is possible. Do not exceed the maximum supply pressure written on the actuator. The minimum supply pressure depends on the boiler pressure and valve size – see product Information Sheet (IS).
6. In case of valves with lever assembly, fit the lever handle (71) onto the lever (70) securing it tightly by screwing the lever fixing bolt (77). Fit the lever locking pin (76) in place.
7. In case of valves with diaphragm actuator and lever assembly, where manual operation is only to be performed in case of an emergency, keep the lever handle (71) in a place of easy and fast access.

5. START-UP

Before performing the start-up procedure, refer to section 1 – Safety information.

The start-up procedure must be followed every time the product is put back into service.

5.1. Preparation for start-up

Before starting up, make sure the following conditions are met:

- All works on the system have been completed.
- All the necessary safety devices have been installed.
- When required, warning notices are used to alert others that the system is starting up.
- The product is correctly installed – see section 4 – Installation.
- Referring to these Installation and Maintenance Instructions (IMI), Information Sheet (IS) and nameplate, check that the product is suitable for the intended installation: temperature, medium, pressure, temperature, etc. – see section 1.2 – Intended use.
- A safety check was performed by qualified personnel. Checking for leaks, structural damage and integrity of system components.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO CONTAMINATION

The presence of small particles in the medium (scale, weld splatters, etc.) may damage the product or cause malfunction.

- Flush pipelines before start-up.
- Clean protection varnishes from pipes and flanges, leftover paint, graphite, grease, etc.

5.2. Start-up procedure

1. When the steam boiler is in operation and normal operating conditions are achieved, check for any leaks.
2. Check that the blowdown valve is sealing tightly. If not, actuate it a couple of times – see section 6 – Operation.



NOTE

24 hours after system start-up, it is recommended to check pipe connection for leaks and retighten when necessary.

6. OPERATION

Before operating the product refer to section 1 – Safety information.

Immediately after completing the start-up procedure, the product is ready for operation.

Blowdown valve operation must be performed at periodic intervals, stipulated by the operator and depending on the steam boiler and its specifications.



CAUTION

RISK OF CRUSHING INJURY DURING BLOWDOWN VALVE OPERATION

Blowdown valve operation causes movement of exposed parts that can crush hands and fingers.

- Keep hands and fingers away from moving parts, e.g. spring and lever assembly, when the valve is being operated manually or while signal pressure supply is connected to the actuator.

RISK OF BURNS DURING BLOWDOWN VALVE OPERATION

The lever of the blowdown valve may heat up depending on the operating conditions.

- Wear heat-resistant gloves when actuating the hand lever and heat resistant shoes when operating the foot lever.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO IMPROPER OPERATION

- Do not operate the lever while the actuator is pressurized.
- Operate the lever in a vertical motion and not sideways.

6.1. Manual operation

In case of valves with lever assembly where manual intermittent operation is to be performed proceed as follows:

1. Remove the lever locking pin (76) from the locking position (A).
2. If the valve is fitted with a diaphragm actuator, make sure the supply pressure is switched off.
3. Push the lever handle (71) vertically downwards as far as it will go, holding it down for approximately three seconds.
4. Return the lever to its original position slowly.
5. If the valve does not shut tightly, this means that some foreign body may be stuck between seat and plug. Actuate the valve again a couple of times, ensuring proper sealing.
6. Fit the lever locking pin in the locking position (A) of the lever.

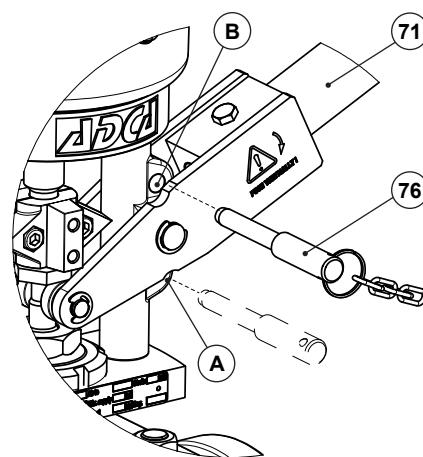


Fig. 2

In case of valves with lever assembly where manual continuous operation is to be performed proceed as follows:

1. Remove the lever locking pin (76) from the locking position (A).
2. If the valve is fitted with a diaphragm actuator, make sure the supply pressure is switched off.
3. Push the lever handle (71) vertically downwards as far as it will go, holding it down while inserting the lever locking pin (76) in the locking position (B).
4. To close the valve, remove the locking pin (76) from the locking position (B) while pushing the lever vertically downwards.
5. Slowly let go the lever handle (71) and when the valve has closed fit the lever locking pin (76) in the locking position (A).

7. SHUTDOWN

Before performing the shutdown procedure, refer to section 1 – Safety information.

7.1. Shutdown procedure

1. Switch of the system and secure it so it cannot be turned on by unauthorized personnel.
2. Allow medium to cool down and completely drain it from the boiler, pipeline and valve.
3. Make sure the pipeline and valve are not under pressure and are at a safe temperature.
4. If the valve is fitted with a diaphragm actuator, switch off the pneumatic air supply and disconnect it from the actuator to depressurize it.
5. If the valve is to be removed from the pipeline – see section 3 - Transport, storage and packaging.

8. PARTS LIST

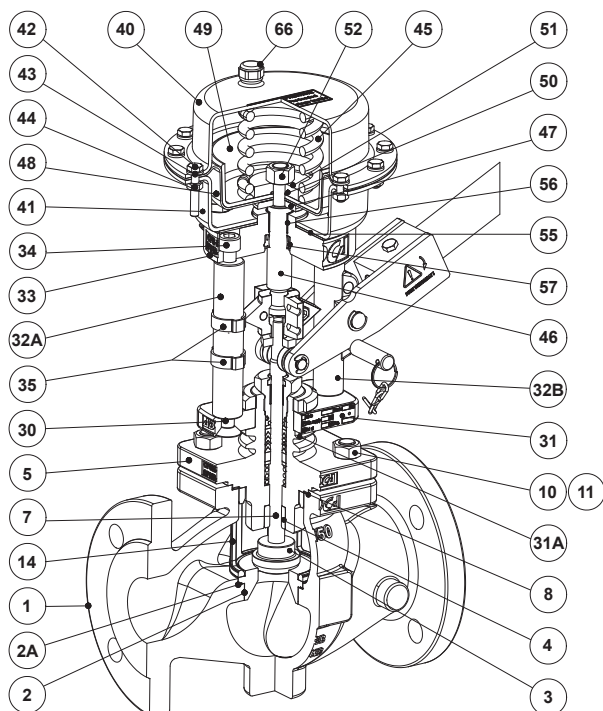


Fig. 3

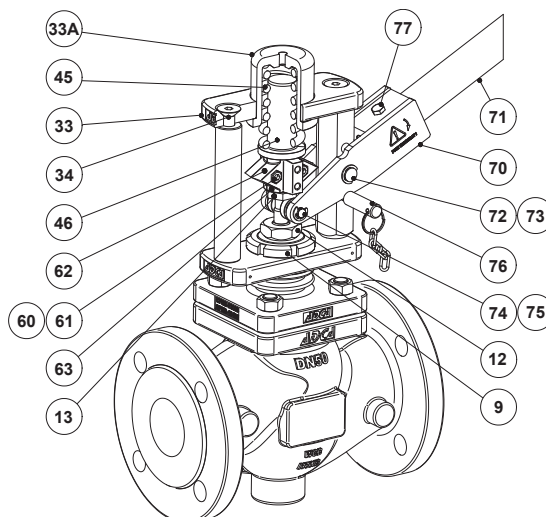


Fig. 4

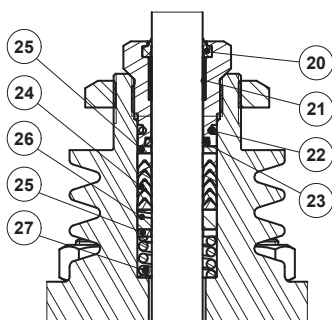


Fig. 5

POS. N°	DESIGNATION	SPARE PARTS
1	Valve body	
2	Seat	X
2A	Seat gasket	X
3	Valve plug	X
4	Lower stem guide	
5	Bonnet	
7	Stem	X
8	Gasket	X
9	Actuator lock nut	
10	Nuts	
11	Studs	
12	Packing nut	
13	Lock nut	

POS. N°	DESIGNATION	SPARE PARTS
14	Seat retainer	
20	Scraper ring	X
21	Plain bearing	X
22	O-ring	X
23	O-ring	X
24	Chevron packing set	X
25	Washer	
26	Stem guide	
27	Spring	
30	Bolts	
31	Lower actuator flange	
31A	Cylindrical pin	
32A	Yoke column	

POS. N°	DESIGNATION	SPARE PARTS	POS. N°	DESIGNATION	SPARE PARTS
32B	Yoke lever column		54	Washers	
33	Upper actuator flange		55	Gasket	
33A	Upper spring carrier		56	Plain bearing	X
34	Bolts		57	Seal ring	X
35	Crimp clamps		60	Bolts	
40	Upper actuator cover		61	Nuts	
41	Lower actuator cover		62	Coupling / travel indicator	
42	Bolts		63	Adapter	
43	Washers		65	Fitting	
44	Nuts		66	Vent plug	
45	Spring		70	Lever	
46	Actuator stem		71	Hand lever handle	
47	Lower diaphragm disc		71	Foot lever handle	
48	Diaphragm		72	Lever axis shaft	
49	Diaphragm plate		73	Elastic ring	
50	O-ring	X	74	Roller	
51	Spring guide		75	Elastic ring	
52	Nut		76	Lever locking pin	
53	Bolts		77	Lever fixing bolt	

9. MAINTENANCE

Before performing a maintenance procedure, refer to section 1 – Safety information.

The product requires maintenance to ensure that it operates correctly and safely throughout its lifetime. Maintenance work should be performed in a planned manner at periodic intervals. These intervals must be defined by the operator according to the service conditions.

9.1. Maintenance procedure

1. Make sure all necessary materials and tools are readily available during maintenance work.
2. Perform the shutdown procedure – see section 7 – Shutdown.
3. Perform the maintenance procedure – see the following sections.
4. Put the valve back into operation – see section 5 – Start-up.

9.2. Removing the actuator from the valve

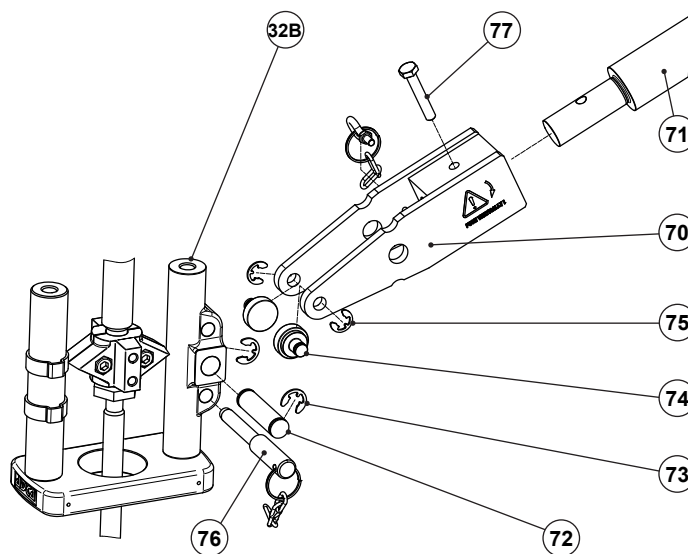


Fig. 6

1. In case of valves with lever assembly proceed as follows:
 - a. Remove each elastic ring (75) and roller (74) followed by an elastic ring (73) on one of the sides of the lever axis shaft (72).
 - b. Remove the lever axis shaft (72) and the lever (70) from the yoke lever column (32B).
2. Apply a signal pressure on the actuator which brings the actuator stem (7) to its mid-travel position.
3. Remove the two coupling halves (62A, 62B) by untightening and removing the two bolts (60) and nuts (61).
4. Loosen the lock nut (63A).
5. Unscrew the actuator lock nut (9) using a c-hook wrench and a soft faced hammer.
6. Remove the actuator and lock nut (9).
7. Switch off the pneumatic air supply and disconnect it from the actuator to depressurize it.

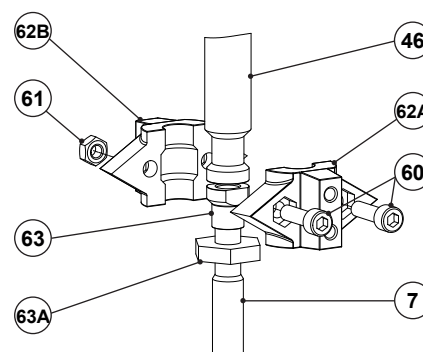


Fig. 7

9.3. Removing the manual operation top from the valve

1. Remove each elastic ring (75) and roller (74) followed by an elastic ring (73) on one of the sides of the lever axis shaft (72).
2. Remove the lever axis shaft (72) and lever (70) from the yoke column (32B).
3. Remove the two coupling halves (62A, 62B) by untightening and removing the two bolts (60) and nuts (61).
4. Slowly and uniformly unscrew the two bolts (34), reducing the spring (45) compression gradually.
5. Remove the upper actuator flange (33), spring carrier (33A), spring (45) and actuator stem (46).
6. Loosen the lock nut (63A).
7. Unscrew the actuator lock nut (9) using a c-hook wrench and a soft faced hammer.
8. Remove the actuator lock nut (9) and manual operation top from the valve.

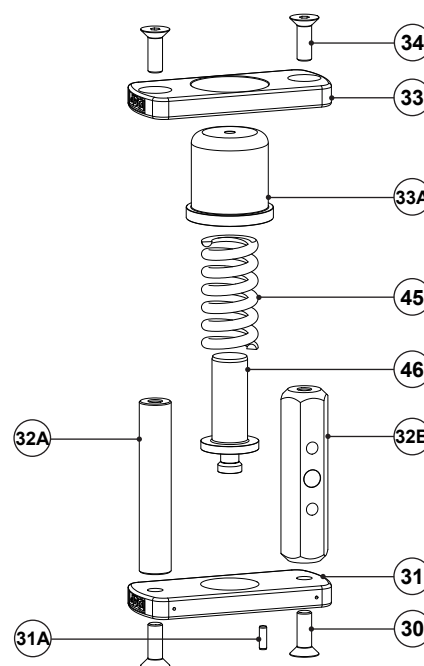


Fig. 8

9.4. Replacing the actuator diaphragm

1. Remove the actuator from the valve – see section 9.2 - Removing the actuator from the valve.
2. Remove the bolts (42), nuts (44) and washers (43) reducing the spring compression gradually. Remove the long bolts last after all other bolts are removed. These should be lubricated with a suitable lubricant and loosened evenly and symmetrically.
3. Remove the upper actuator cover (40) and spring (45). Pull the diaphragm assembly consisting of diaphragm plate (49), diaphragm (48) and actuator stem (46) carefully from the lower actuator cover (41) to avoid damage to the seal ring (57) and plain bearing (56).
4. Clamp the actuator stem (46) into a vise with soft jaws making sure not to damage the actuator stem finish.
5. Unscrew the nut (52), remove the spring guide (51), O-ring (50), diaphragm plate (49) and diaphragm (48).
6. Fit a new diaphragm by rotating it into the actuator stem (46) thread and reassemble the diaphragm plate (49), O-ring (50) and spring guide (51).
7. Apply a thread locker such as Loctite® 243 on the upper thread of the actuator stem. Tighten the nut (52) with the recommended torque – see section 9.9 –Tightening torques.
8. Remove the diaphragm assembly from the vise.
9. Apply a suitable lubricant to the actuator stem (46) and on the seal ring (57).
10. Place the diaphragm assembly onto the lower actuator cover (41), making sure the sealing elements are not damaged.
11. Refit the spring (45) ensuring that it is in good condition. Renew if necessary.
12. Place the upper actuator cover. Ensure the spring is well centered.
13. Tighten the lower and upper actuator covers (40, 41) together using the bolts (42), nuts (44) and washers (43) with the recommended torque – see section 9.9 – Tightening torques. Tighten evenly to avoid distortion.

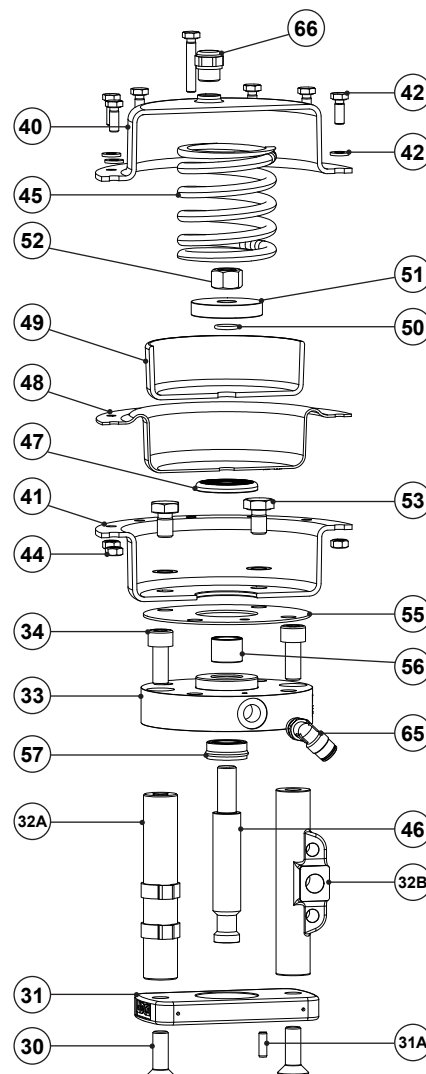


Fig. 9



NOTE

The washers (43) are fitted from factory below the bolt heads to protect the paint or surface coating of the actuator covers as these are the ones threaded down while the nuts (44) are fixed. When reassembling with manual tools place the washers (43) on the opposite side, above the nuts (44).

9.5. Replacing the actuator stem seals

1. Follow steps 1 through 3 of section 9.4 – Replacing the actuator diaphragm.
2. Use a suitable tool to remove it from the upper actuator flange (33) and fit a new seal ring.
3. Remove the plain bearing (11) and replace. Only replace the plain bearing if really necessary and pay attention not to damage the sleeve surface.
4. Follow steps 10 through 13 of section 9.4 - Replacing the actuator diaphragm.

9.6. Replacing the valve stem seals, seat and plug

1. Remove the actuator or manual operation top from the valve by following the instructions on section 9.2 - Removing the actuator from the valve – and section 9.3 - Removing the manual operation top from the valve – respectively.
2. Undo the body nuts (10) gradually in a crisscross pattern and separate the bonnet (5) from the valve body (1).
3. Unscrew the adaptor (63) and lock nut (63A) from the valve stem.
4. Unscrew the gland nut (12) and remove it carefully together with the O-rings (22, 23).
5. Carefully pull the valve plug (3) and stem (7) out of the bonnet (5) through its bottom. Inspect the plug sealing surface and replace plug/stem assembly if necessary.
6. Pull out all stem sealing components (24, 25, 26, 27) from the packing box using a suitable tool.
7. Clean the packing box and slide the valve plug (3) and stem (7) into the bonnet (5) once again.
8. Remove the body gasket (8), seat retainer (14), seat (2) and seat gasket (2A). Clean gasket sealing surfaces thoroughly, leaving no remaining graphite leftovers. Inspect the seat sealing surface condition and replace seat if necessary.
9. Fit a new body gasket seat and (2A, 8) onto the valve body (1), and install the

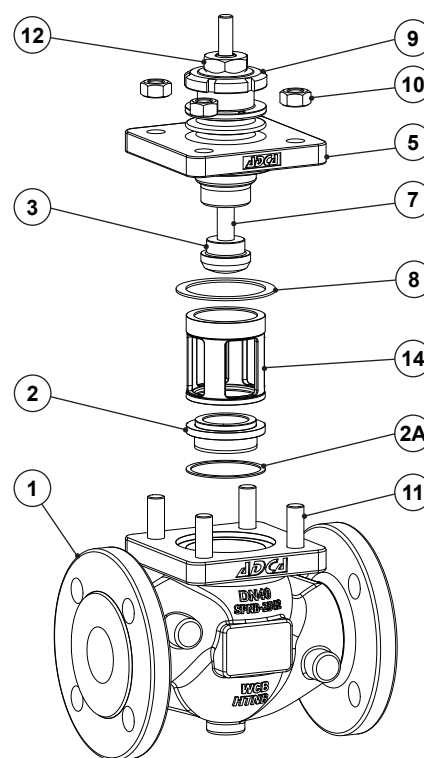


Fig. 10

seat (2) and seat retainer (14). Make sure the seat retainer windows are on the bottom and ensure one of them is pointing to the valve outlet port. Place the bonnet (5) on the valve body (1).

10. Carefully slide the stem sealing components into the packing box according to Fig. 11.
11. Renew the scraper ring (20), plain bearing (21) and O-rings (22, 23) if necessary. Fit the O-rings (22, 23) and gland nut (21), screwing it loosely.
12. Firmly press the valve plug (3) against the seat (2) while tightening the body nuts (10) in a crisscross pattern by hand. Raise the stem until the valve reaches full stroke position and firmly push the stem fully downwards.
13. Proceed by tighten the nuts in four stages with incremental torques (30%, 60%, 80% and 100%) finally achieving the recommended torques – see section 9.9 – Tightening torques. Between each stage raise the stem until the valve reaches full stroke position and firmly push the stem fully downwards.
14. Tighten the gland nut (12) with the recommended torque – see section 9.9 – Tightening torques.

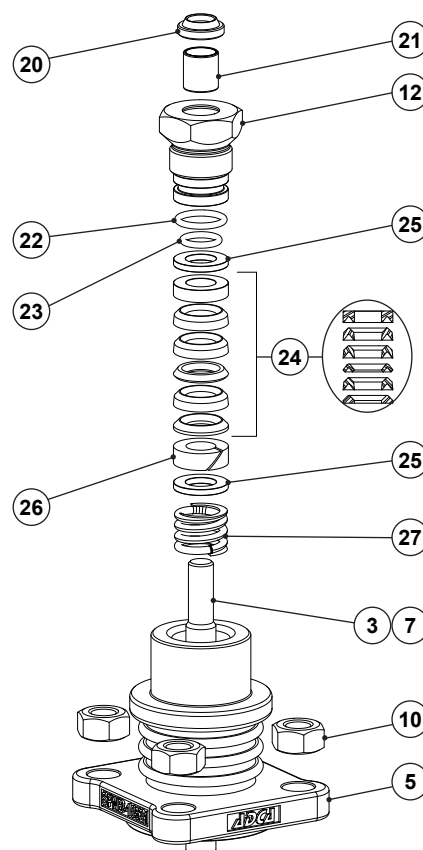


Fig. 11

9.7. Mounting the actuator onto the valve

1. Fasten the lock nut (63A) and adaptor (63) onto the valve stem (7) until the female thread of the adaptor is no longer visible.
2. Manually push the valve stem (7) downwards until the plug touches the seat.
3. Apply a signal pressure to the actuator which brings the actuator stem (46) to its mid-travel position.
4. Carefully place the actuator yoke over the valve stem, aligning the cylindrical pin (31A), and lower it until the lower actuator flange (31) touches valve bonnet (5) shoulders.
5. Align the yoke columns and secure the actuator with the actuator lock nut (9) using a c-hook wrench and a soft faced hammer – see section 9.9 – Tightening torques.
6. Apply a signal pressure which corresponds to the lower operating range value of the actuator (see actuator nameplate) and manually adjust the adaptor (63) until it presses tightly against the actuator stem.
7. Release the signal pressure.
8. Fit the two coupling halves (62A, 62B) and clamp them together, loosely tightening the two bolts (60) and nuts (61).
9. Tighten the lock nut (63A).

10. Operate the actuator through its full stroke range a couple of times to ensure alignment and tighten the bolts (3) tightly.
11. Check that the valve stem commences to move when the signal pressure matches the lower operating range value, and is fully open when the signal pressure matches the upper operating range value ± 0.1 bar.
12. Align the crimp clamps (35) with the tip of the coupling (stroke indicator) at the end positions.
13. In case of valves with lever assembly proceed as follows:
 - a. Fit the lever (70) in the yoke lever column (32B) and assemble the rollers (74) with the elastic rings (75), according to Fig. 6.
 - b. Position the rollers below the lock nut (63A) and align the center hole of the lever (70) with the mating hole on the yoke lever column (32B).
 - c. Insert the lever axis shaft (72) on the assembly and fix it with the elastic rings (73).

9.8. Mounting the manual operation top onto the valve

1. Fasten the lock nut (63A) and adaptor (63) onto the valve stem (7) until the female thread of the adaptor is no longer visible.
2. Manually push the valve stem (7) downwards until the plug touches the seat.
3. Carefully place the manual operation top yoke over the valve stem, aligning the cylindrical pin (31A), and lower it until the lower actuator flange (31) touches valve bonnet (5) shoulders.
4. Align the yoke columns and secure the manual operation top with the actuator lock nut (9) using a c-hook wrench and a soft faced hammer – see section 9.9 – Tightening torques.
5. Place the actuator stem (46) above the adaptor (63) and secure it by fitting the two coupling halves (62A, 62B) and clamping them together, tightening the two bolts (60) and nuts (61) tightly. See Fig. 7.
6. Fit the spring (45), spring carrier (33A) and upper actuator flange (33).
7. Slowly and uniformly tighten the two bolts (34) until the recommended torque is achieved – see section 9.9 – Tightening torques.
8. Fit the lever (70) in the yoke lever column (32B) and assemble the rollers (74) with the elastic rings (75).
9. Position the rollers below the lock nut (63A) and align the center hole of the lever (70) with the mating hole on the yoke lever column (32B).
10. Insert the lever axis shaft (72) on the assembly and fix it with the elastic rings (73).

9.9. Tightening torques

POS. N°	DESIGNATION	TORQUE (Nm)
		All sizes
9	Actuator lock nut	100
10	Nuts	50
12	Gland nut	30-50
30	Bolts	35
34	Bolts	35
52	Nut	50
53	Bolts	35
42, 44	Bolts and nuts	16

10. TROUBLESHOOTING

Before applying any corrective measure, refer to section 1 – Safety information.

If the malfunction cannot be solved with the help of the following table, contact VALSTEAM ADCA or its representative.

Malfunction	Possible cause	Corrective measure
Valve leaks to the atmosphere at the stem.	The stem sealing or body sealing is defective.	<ul style="list-style-type: none"> Replace stem seals – see section 9.6 - Replacing the valve stem seals, seat and plug.
The valve leaks to the atmosphere through the pipeline connection flanges.	Loose bolts on the pipeline connection flanges, missing or damaged gasket.	<ul style="list-style-type: none"> Retorque bolts correctly. If the leakage persists dismantle, inspect flange surfaces, replace gaskets and tighten with the appropriate torque.
The valve leaks to the atmosphere between body and bonnet.	Loose body nuts, missing or damaged body gasket.	<ul style="list-style-type: none"> Retorque nuts correctly. If the leakage persists dismantle, inspect body and bonnet sealing surfaces, replace body gasket and tighten with the appropriate torque.
Excessive valve seat leakage.	Damaged or worn sealing surface on valve plug and/or seat.	<ul style="list-style-type: none"> Replace plug and seat - see section 9.6 - Replacing the valve stem seals, seat and plug.
	Damaged or missing seat gasket.	<ul style="list-style-type: none"> Inspect and install/replace seat gasket – see section 9.2 - Replacing the valve stem seals, seat and plug.
	Dirt or foreign particles inside the valve, particularly between seat and plug.	<ul style="list-style-type: none"> Flush the valve by opening the valve quickly several times. Open the valve and clean the valve trim fully. Replace necessary components and resolve the source of the issue.
	Pneumatic actuator is not venting completely.	<ul style="list-style-type: none"> Check pneumatic instrumentation, e.g., solenoid valve leakage. Check if the vent plug is clogged.
Jerky stem movement.	Stem is seizing due to dirt deposits or foreign particles.	<ul style="list-style-type: none"> Open the valve and clean the valve trim fully. Replace necessary components and resolve the source of the issue.
	Actuator is not powerful enough.	<ul style="list-style-type: none"> Contact VALSTEAM ADCA.
Pneumatic actuator does not move the valve stem to its full stroke position.	Insufficient supply pressure.	<ul style="list-style-type: none"> Ensure the signal pressure is sufficient to stroke the actuator fully. The VPA26/2 is a FTC (Fluid to Close) valve hence the minimum supply pressure depends on the boiler pressure. Consult IS - Information Sheet. Check for leakages on the actuator.
	Mounted instrumentation and accessories (e.g., air filter regulator, solenoid valve, limit switches) do not work satisfactorily.	<ul style="list-style-type: none"> Check the Installation and Maintenance Instructions (IMI) of the mounted instrumentation and accessories. Test the actuator without accessories (do not exceed the maximum supply pressure to the actuator).

Malfunction	Possible cause	Corrective measure
Stem does not move.	No signal pressure is being supplied to the actuator.	<ul style="list-style-type: none"> Check the pneumatic air supply and fix.
	The diaphragm is defected or torn.	<ul style="list-style-type: none"> Replace the diaphragm – see section 9.4 - Replacing the actuator diaphragm.
	Actuator is blocked.	<ul style="list-style-type: none"> Unblock the actuator.
	Mounted instrumentation and accessories (e.g., air filter regulator, solenoid valve, limit switches) do not work satisfactorily.	<ul style="list-style-type: none"> Check the Installation and Maintenance Instructions (IMI) of the mounted instrumentation and accessories. Test the actuator without accessories (do not exceed the maximum supply pressure to the actuator).

11. DISPOSAL

Once the product has reached the end of its working life, it should be sent for disposal in accordance with the prevailing national and local regulations.

Before disposal make sure that the product is clean and free from fluid residues.

During its disposal, pay special attention to rubbers, resins and polymer components (PVC, PTFE, PP, PVDF, FKM, NBR, etc.).

Do not dispose of components and hazardous substances together with household waste.

12. RETURNING PRODUCTS

Information regarding hazards and precautionary measures to be considered due to contaminating fluids and residues or mechanical damage that may represent a health, safety or environmental risk, must be provided in writing when returning products to VALSTEAM ADCA.



WARNING

RISK DUE TO PRESENCE OF HAZARDOUS RESIDUES ON RETURNED PRODUCTS

Contaminated fluids and residues may represent an environmental risk, or risk to VALSTEAM ADCA personnel.

- Information regarding any hazards or precautionary measures to be considered must be provided in writing when returning products to VALSTEAM ADCA.
- Health and Safety information sheets relating to any substances identified as hazardous or potentially hazardous must be provided outside the packaging.
- Use Hazmat labels on the packaging.

IMPORTANTE NOTE

Total or partial disregard of these Installation and Maintenance Instructions involves loss of any right to warranty.

The extent and warranty period are specified in the “General sales conditions”.

